

DESCRIPTION

The M54459L is a semiconductor integrated circuit consisting of a built-in 1/20 and 1/100 high speed frequency divider featuring an ECL circuit configuration.

FEATURES

- High-speed operation ($f_{max} = 130\text{MHz}$)
- Operation at low input amplitudes (180mV_{p-p} minimum input amplitude)
- TTL level output

APPLICATION

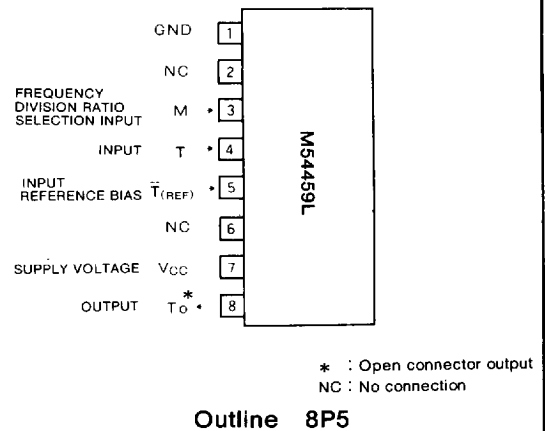
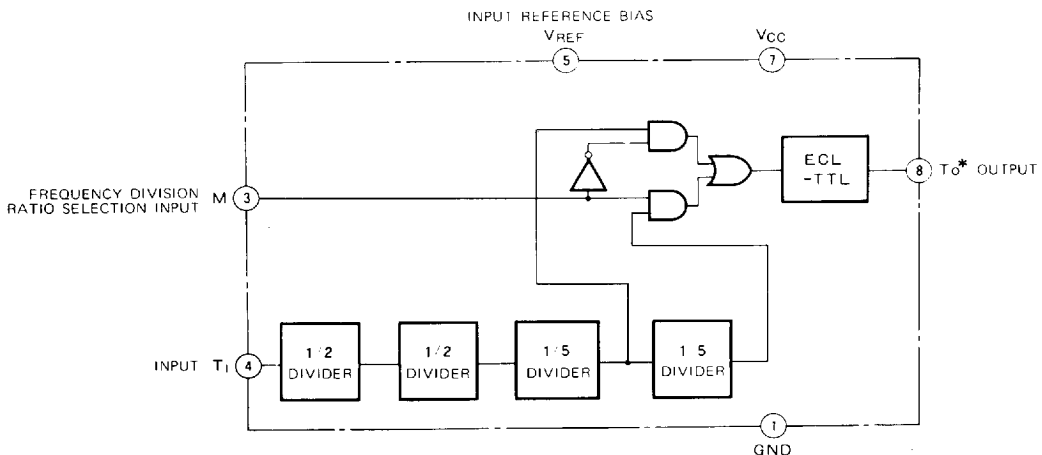
FM radio prescalers, digital equipment for consumer and industrial applications.

FUNCTION

This divider is based on an ECL circuit configuration. When a frequency up to a maximum of 130MHz is applied to the T_1 input pin, a 1/20-divided output is produced when the division ratio selection input pin (M) is low-level or a 1/100-divided output is produced when the division ratio selection input pin (M) is high-level. The output (T_0) is available in the TTL level open collector format.

Frequency division ratio selection input (M) and ratios

M	Low	High
Division ratio	1/20	1/100

PIN CONFIGURATION (TOP VIEW)**BLOCK DIAGRAM**

* : OPEN COLLECTOR OUTPUT

1/20, 1/100 HIGH SPEED DIVIDER

ABSOLUTE MAXIMUM RATINGS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

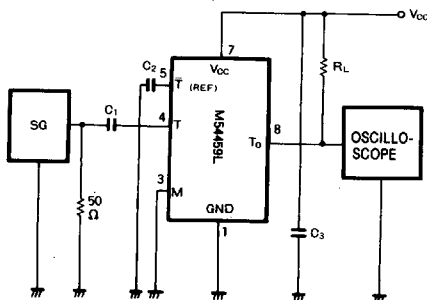
Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		7	V
V_I	Input voltage		2.5	V
V_O	Output applied voltage		5.5	V
P_d	Power dissipation	$T_a = 25^\circ\text{C}$	1.33	W
T_{opr}	Operating temperature		$-10 \sim +75$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		4.5	5	5.5	V
f_{IN}	Input frequency		30		130	MHz
V_{IN}	Input amplitude	$V_{CC} = 5\text{V}$, $f_{IN} = 30 \sim 130\text{MHz}$	200		800	mV _{P-P}
$V_{IH(M)}$	High-level M input voltage		2.6		V_{CC}	V
$V_{IL(M)}$	Low-level M input voltage		0		0.4	V

ELECTRICAL CHARACTERISTICS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{CC}	Supply current	$V_{CC} = 5\text{V}$		6.5	10	mA
V_{IN}	Prescaler operating input	$V_{CC} = 5\text{V}$, $f_{IN} = 30 \sim 130\text{MHz}$, $T_a = 25^\circ\text{C}$			180	mV _{P-P}
$I_{IH(M)}$	High-level M input current	$V_{CC} = 5\text{V}$, $V_{IH(M)} = 2.6\text{V}$		2		μA
$I_{IL(M)}$	Low-level M input current	$V_{CC} = 5\text{V}$, $V_{IL(M)} = 0.4\text{V}$		0.1		μA
$I_{O(leak)}$	Output leak current	$V_{CC} = 5\text{V}$, $V_O = 5.5\text{V}$			100	μA
V_{OL}	Low-level output voltage	$V_{CC} = 5\text{V}$, $I_{OL} = 5\text{mA}$			0.5	V

 f_{max} TEST CIRCUIT

$C_1 \approx 1000\text{pF}$, $C_2 \approx 1000\text{pF}$, $C_3 \geq 10000\text{pF}$, $R_L \approx 5\text{k}\Omega$

Notes: The above figure shows the configuration with 1/20 frequency division.
Connect the frequency division ratio selection input (M) to the supply voltage V_{CC} pin for 1/100 frequency division.

TYPICAL CHARACTERISTICS

INPUT AMPLITUDE VS
INPUT FREQUENCY